

Sustainable afforestation: feasible or fallacious?

If we cannot build new forests, let's turn our concrete one's to green

It is no secret that one of the largest causes of climate change is the increased concentration of carbon dioxide and greenhouse gases that build up in our atmosphere. These greenhouse gases play a huge role in retaining heat in our atmosphere and act as an ongoing symbol of anthropogenic pollution.

In response to the rapid increase in greenhouse gases, engineers and scientist alike have been working tirelessly to design efficient machinery and transport, improving renewable energy generation and designing technology to reverse these effects, such as carbon capture. However, have we overlooked the oldest, most available and low-cost carbon capture device... **trees**.

Everybody knows the story, through the process of photosynthesis, plants use carbon dioxide, water and sunlight and produce oxygen and complex carbohydrates used in the body of plants. Such that the carbon dioxide in our air becomes the bark, branches and leaves that we use to build, cook and manufacture everyday items.

But how many trees would it take to convert all the excess carbon dioxide into oxygen and ease the pressure on our atmosphere and environment? Well someone did the maths and it is 1.2 trillion (Crowther, Glick, Maynard, Ashley-Cantello, Evans, & Routh, 2017).

Investigated by Dr Thomas Crowther and his team at Crowther Lab in March of 2019, a study into the necessary number of trees required to reverse Climate Change yielded a conclusion of 1.2 trillion trees. But that leads to the obvious questions, where? and how?

The Crowther Lab proposed the idea of afforestation, the restoration and development of new forests, totalling 1.7 to 1.8 billion hectares of unused land (Bastin, Finegold, Garcia, Mollicone, Rezende, Routh & Crowther, 2019). Let's put that into perspective:

- Australia is 769.2 million hectares in area (Australian Government, 2020);

therefore, we need to locate unused land equal to over two and a third Australias;

- The world population is 7.577 billion (World Population Review, 2020); therefore, every human on Earth needs to plant 158 new trees;
- Planting inland forests where unused land is more available may require the additional supply of irrigation, as traditional rainfall may not be sufficient to sustain a forest; and
- It would likely take decades and billions of dollars to finance, coordinate and develop these forests. Time of which the climate and environment do not have.

Understandably, there have been no major afforestation efforts, there are a number of smaller reforestation and tree-planting initiatives, both political and otherwise, that aim to achieve this effect on a large scale:

- On the 15th of May 2019, the Philippine Congress passed a Bill that mandated all students must plant at least 10 trees in order to graduate. The requirements: simply plant 10 trees in any natural or urban environment (e.g. forests, mangroves, reserves, urban areas). Called the *Graduation Legacy for the Environment Act 2016*, the initiative would lead to the planation of over 175 million new trees each year.
- In May of 2019, the internet challenged a creator and personality called MrBeast to plant 20 million trees in celebration of reaching 20 million subscribers on YouTube. In partnership with the Arbor Day Foundation, MrBeast and other creators such as Mark Rober, launched an online campaign to collect donations with the promise that \$1 = 1 tree planted. They reached the goal and since the initiative's launch, they have raised over \$22,026,578 (equal to 22,026,578 trees!) with notable donations from Tobi Lutke, Elon Musk and Marc Benioff.

Despite the great work these organisations are doing, it is pretty clear that planting 1.2 trillion trees may not be a feasible solution to Climate Change, however, that is not to undermine the value of [carbon sequestration](#) by trees. Professor Simon Lewis from the University College London suggested planting trees in urban areas. The effects of which could (Aerin, Wilson & Lewis, 2014):

- Play a role in mopping up residual carbon emissions;

- Improve air quality;
- Improve water quality;
- Maintain key ecosystem and environmental services, such as the provision of wildlife habitat; and
- Even improve the mood of residents (Berman, Jonides & Kaplan, 2008).

Using this method, the value of planting trees can be materialized but it may not be the sole solution. Professor Simon Lewis also stated, *“the only way to stabilise the climate is for greenhouse gas emissions to reach net-zero, which means dramatic cuts in emissions from fossil fuels and deforestation”*.

Therefore, while building new forests may not be the most appropriate solution, with careful integration of other techniques, such as reducing sources of emission, rolling out new technology and promoting legislative changes, turning our cities green, can be a powerful tool to fighting Climate Change.

So, what does this all mean?

Fundamentally, beyond the high cost of filling all the empty unused space with forests, afforestation is not a feasible approach. For example, consider that in 2018, Australia produced around 510 million tonnes of coal of which 75% was exported (Cunningham, Uffelen, & Chambers, 2019). That means in 2018, Australia produced 16.16 tonnes per second and consumed 4.12 tonnes per second. Considering it takes 100 to 300 million years for organic matter to partially decompose and compact into coal, we can see how the world is using coal and producing GHG's at rates that cannot be balanced by planting trees.

However, not only do trees have an incredible ability to [sequester carbon dioxide](#) but that play a large role in maintaining our environmental systems (including nutrient and water cycling), managing both air and water quality and supporting key elements of life on Earth, including wildlife habitat and important materials. As a home user, you can implement these in a number of ways:

- If you have a yard or a balcony, planting and maintaining plants (especially natives) can be a valuable action for the environment, it may not be 158, but it is one plant closer;
- Maintaining nature strips, parks or other urban forests and terrestrial

systems will have great benefits for you and the environment; and

- Volunteering for tree-planting or garden initiatives is a great way to improve your positive impact on the environment, you just might have to wait until COVID restrictions ease.

For further information about your environmental footprint and that of others, including enterprises, do visit [THRIVE Project](#), designed to guide you towards sustainable prosperity.

Written in collaboration with THRIVE Tribe member Thomas Jackson.

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